

specimens are not fully matured. One of the two specimens has been presented to the "Lea Collection," in the Academy of Natural Sciences of Philadelphia.

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ON A COLLECTION OF MOLLUSKS FROM GRAND TOWER, ILLINOIS.

BY FRANK C. BAKER.

During the latter part of April and first part of May, Mr. Frank M. Woodruff spent two weeks collecting birds in Jackson and Union Counties, Illinois, and incidentally picked up a number of mollusks, and the general conditions of the locality, and the small number of shells collected seem to warrant a few notes. This locality is situated on the Mississippi River, north of Big Muddy River, in the southwestern part of the State.

Of the localities visited Mr. Woodruff says: "The shells were found in a rocky glen or cleft in the center of the chain of high precipices known by the names of Fountain Bluff, Devil's Bake Oven and Backbone. This cleft or ravine begins about three-quarters of a mile from the face of the cliff and gradually descends in a northwesterly direction until the bottom is reached, and one may stand upon a broad shelf of rock ten feet from the ground, with high overhanging cliffs of bare rock on both sides. A stream of clear spring water flows down this ravine and falling over the high shelves of rock has formed numerous round pools or basins. I was surprised to find no shells in the stream, and could only collect a few specimens of *Limnaea humilis*, which I found clinging to the wet moss under the falls. The balance of the shells were found under the moss and old logs at the base of the cliff. Fountain Bluff is five miles from the town of Grand Tower, and is three miles long from north to south and about one and a half miles wide. According to Worthen's Geology of Illinois, the Backbone or ridge is formed by an uplift of Devonian strata which is tilted to an angle of about  $25^{\circ}$ , and dips to the northeast. The bluffs consist of Chester limestone and sandstone overlaid by conglomerate. The top of the bluff is covered with a rich growth of timber, among which are Willow, Sweet Gum, Qupelo tree, Sycamore, Cottonwood, Honey Locust, Hock Berry, Box Alder, Red Birch, White Ash, Black Ash, Red Oak, Mulberry, Persimmon, White and Black Oak, etc., are the most common."

Thirteen species were obtained, and may be noted as follows:

1. *CIRCINARIA CONCAVA* Say. A number of large and typical specimens of this species were collected and kept alive for a long time on the writer's desk. On May 18th two individuals were noted in coitu, the coitus lasting from 8 o'clock A. M. to 6 o'clock P. M. During this time both animals were perfectly quiet, the eye peduncles and tentacles drawn into the head and the foot contracted to form a rounded oval. During the coitus the heart, which normally beats about 75 times per minute, was reduced to 19 very slow and long beats. The foot of the snail taking the active part was partly covered by the passive snail, and the former's head was slightly lifted. The specimens measured about 15 mill. in greatest diameter.

2. *VITREA ARBOREA* Say. A few specimens of this species were obtained under and in rotting logs. All were perfectly typical.

3. *OMPHALINA FULIGINOSA* Griffith. The specimens obtained were rather dark in color and about half grown, the umbilicus wide and deep.

4. *POLYGYRA (MESODON) ALBOLABRIS* Say. But a single specimen of this species was obtained alive, and that was very large, measuring 34 mill. in greatest diameter. The animal was kept in captivity for several weeks, and was more active than any of the other species of *Mesodon* that the writer has studied. It was started at the bottom of a book case door four feet long and reached the top in about half an hour. The examination of the lingual membrane gave 45-1-44 teeth with ten perfect laterals. In this membrane the 38th tooth was abnormal in having three well formed cusps of equal size, instead of a bifid inner cusp.

5. *POLYGYRA (MESODON) EXOLETA* Binney. Several typical specimens of this species were collected, among which there was one without the parietal tooth. The lingual membrane of one specimen gave 47-1-47 teeth with eight perfect laterals. The marginals were very variable, some being with and some without side cusps. It is probable that several teeth were torn away from this membrane, although there could not have been the normal number given by Binney, 60-1-60.

6. *POLYGYRA (MESODON) THYROIDES* Say. All specimens were of the normal form.

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<sup>1</sup> For the change in names of several of the genera and species here listed, see Pilsbry, Proc. Phila. Acad., 1894-97, where adequate reasons are given.

7. *POLYGYRA* (*TRIODOPSIS*) *TRIDENTATA FRAUDULENTA* Pilsbry. A single specimen of this subspecies was collected by Mr. Woodruff. Its radula differed considerably from that given in Binney's Manual of American Land Shells (p. 292), where 40-1-40 teeth with 12 perfect laterals is given. The present specimen had 27-1-27 teeth with 11 perfect laterals. The 17th tooth had a bifid inner cutting point, but all before it were simple. The 13th tooth showed a decided modification. The jaw was as usual, with 12 rather stout ribs.

8. *POLYGYRA* (*TRIODOPSIS*) *INFLECTA* Say. The specimens collected were of the usual form.

9. *POLYGYRA* (*STENOTREMA*) *MONODON FRATERNA* Say. The specimens examined had 31-1-31 teeth on the lingual membrane with 10 perfect laterals, and the 13th tooth had a bifid inner cutting point.

10. *POLYGYRA* (*STENOTREMA*) *HIRSUTUM* Say. The specimens obtained were of the normal form. One specimen measured  $8\frac{1}{2}$  mill. in greatest diameter. The radula was as given by Binney, 22-1-22 teeth with 10 perfect laterals, and the jaw had eight ribs.

11. *PYRAMIDULA ALTERNATA* Say. The specimens collected are rather coarsely striated (or ribbed) and approach var. *mordax* Shuttl., but the ribbing is not quite as strong as in that variety.

12. *PYRAMIDULA PERSPECTIVA* Say. Among the specimens obtained was one measuring 10 mill. in greatest diameter.

13. *LIMNÆA HUMILIS* Say. A number of specimens were collected in the moss under a waterfall. Mr. Woodruff reports finding all the specimens out of the water.

It was remarkable that so few species of mollusks were found, and also that the species were so few in individuals. Mr. Woodruff says that a part of the region is made up of sandstone and conglomerate, and this may account for the great paucity of molluscan life. Mr. Woodruff searched diligently many times, particularly for the smaller forms, and states that at no time did he find more than one shell at one time, all seeming to live solitary lives.

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#### ISAAC LEA DEPARTMENT.

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[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

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Through the courtesy of Mr. Herbert Lowe, the writer had the pleasure of meeting our former member, Mr. Edward W. Roper of